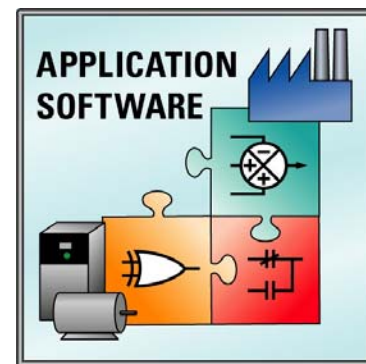


# Drive Application Software Application Set

Application Set Title	TorqProve™ - Vertical Drop Lift with Encoder
Drive Product	PowerFlex® 700 Vector Control
File Name for (AS)	AS PF700 VDL TorqProve.doc
Date / Revision	12/13/04 - 01



Attention: This document and related file(s) are designed to supplement configuration of the listed drive product. The information provided does not replace the drive products user manual and is intended for qualified personnel only.

Description: Programming drive using TorqProve for a counterbalanced vertical drop lift with an encoder. PLC was used to send digital signals to drive for starting and stopping as well as two speed set points. A slow speed was used to creep into position via a limit switch to the PLC.  
Reference Application Brief Publication:  
PowerFlex 700 App Brief-Vertical Drop Lift, [20B-AP003A-EN-P](#) – April 2005

Limitations:

Options & Notes: **ATTENTION:** To guard against personal injury and/or equipment damage caused by unexpected brake release, verify the Digital Out 1 brake connections and/or programming. The **default** drive configuration energizes the Digital Out 1 relay when power is applied to the drive. The PowerFlex 700 drive **will not control the mechanical brake until TorqProve is enabled**. If the brake is connected to this relay, it could be released. If necessary, **disconnect the relay output until wiring/programming can be completed and verified**.

## Drive Input & Output Connections:

Inputs	Function	Description
DI 1	4 - Stop - CF	P361
DI 2	8 - Run Forward	P362
DI 3	9 - Run Reverse	P363
DI 4	15 - Speed Sel 1	P364
DI 5	(0 - Not Used)	
DI 6	1 - Enable	P366
AI 1		Not Used
AI 2		Not Used
Outputs	Function	Description
DO 1	4 - Run	P380 - Brake relay output. Only <b>terminals 12 &amp; 13</b> should be used. When TorqProve is "enabled" in P600, Relay 1 is dedicated for brake control only. (All other programmed selections are ignored.)
DO 2	19 - Motor Overload	P381
DO 3	1 - Fault	P382
AO 1		Not Used
AO 2		Not Used



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### Parameter Configurations

Changes from Default Parameter Settings (Any listed defaults are in gray.)

Par	Name	Value	Link	Description
41-45	Motor NP . . .	per nameplate		(Data entered per motor nameplate)
53	Motor Cntl Sel	4 - "FVC Vector"		
80	Feedback Select	3 - "Encoder"		Must use quadrature and differential encoder
90	Speed Ref A Sel	11 - "Preset Spd1"		
93	Speed Ref B Sel	12 - "Preset Spd2"		
101	Preset Speed 1	60 Hz		
102	Preset Speed 2	12 Hz		
140	Accel Time 1	2.0 Sec.		Affected by desired cycle time and system Inertia
142	Decel Time 1	2.0 Sec.		Affected by desired cycle time and system Inertia
146	S Curve %	20%		Used to smooth accel / decel profile
238	Fault Config 1	Bit 8 = 1 Bit 12 = 1		Bit 8 enables Input Phase Loss and bit 12 enables Output Phase Loss (Internal value = 4426)
436	Pos Torque Limit	120%		Limit was used to protect machine in event of a jam.
449	Speed Desired BW	35 Rad/Sec.		Typical range will be 20-40 rad/sec. Adjusting this will automatically change Parameters 445 and 446
445	Ki Speed Loop	(39.9)		For Reference Only. Automatically adjusted when Parameters 449 is changed.
446	Kp Speed Loop	(4.6)		For Reference Only. Automatically adjusted when Parameters 449 is changed.
447	Kf Speed Loop	0.1		
450	Total Inertia	(0.13 Sec)		For Reference Only. Automatically determined during inertia autotune. (Note: Kp = BW x Inertia)
***	<b>TorqProve Settings</b>			
600	TorqProve Cnfg	Bit 0 = 1		This "enables" TorqProve and Digital Output 1 will now control the mechanical brake (Note: this is not changed when "Reset to Defaults")
601	TorqProve SetUp	0		Default – used only if using communications to control TorqProve parameters.
602	Spd Dev Band	3.0 Hz		This was used to protect machine in event of a jam. It may need to increase depending on application.
603	Spd Band Integrator	100 mSec.		May need to increase depending on application.
604	Brake Release Time	0.01 Sec		
605	ZeroSpdFloatTime	0.1 Sec		Set to minimum since these lifts rarely need float.
606	Float Tolerance	0.1 Hz		Set to minimum since these lifts rarely need float.
607	Brk Set Time	0.10 Sec		Default
608	TorqLim SlewRate	1.0 Sec		
609	BrkSlip Count	10 Revs		(Note: This may be too low for some applications)
610	Brk Alarm Travel	1.0 Rev		Default
611	MicroPos Scale%	10 %		Default – not used in this application